

Claims:

1. An aqueous composition useful for polishing silica and silicon nitride on a semiconductor wafer comprising by weight percent 0.001 to 1 quaternary ammonium compound, 0.001 to 1 phthalic acid and salts thereof, 0.01 to 5 carboxylic acid polymer, 0.01 to 5 abrasive and balance water.
2. The composition of claim 1 wherein the quaternary ammonium compound is selected from the group comprising: tetramethyl ammonium hydroxide, tetraethyl ammonium hydroxide, tetrapropyl ammonium hydroxide, tetraisopropyl ammonium hydroxide, tetracyclopropyl ammonium hydroxide, tetrabutyl ammonium hydroxide, tetraisobutyl ammonium hydroxide, tetratertbutyl ammonium hydroxide, tetrasecbutyl ammonium hydroxide, tetracyclobutyl ammonium hydroxide, tetrapentyl ammonium hydroxide, tetracyclopentyl ammonium hydroxide, tetrahexyl ammonium hydroxide, tetracyclohexyl ammonium hydroxide, and mixtures thereof.
3. The composition of claim 1 wherein the phthalate salt is selected from the group comprising: ammonium hydrogen phthalate and potassium hydrogen phthalate.
4. The composition of claim 1 wherein the abrasive is ceria.
5. The composition of claim 4 wherein the ceria has an average particle size of between 50-200 nm.
6. The composition of claim 5 wherein the ceria has an average particle size of between 80-150 nm.
7. The composition of claim 1 wherein the aqueous composition has a pH of 4 to 7.
8. An aqueous composition useful for polishing silica and silicon nitride on a semiconductor wafer comprising by weight percent 0.001 to 1 tetramethyl ammonium hydroxide, 0.001 to 1 ammonium hydrogen phthalate, 0.01 to 5 polyacrylic acid, 0.01 to 5 ceria and balance water, wherein the composition has a pH of 4 to 7.

9. A method for polishing silica and silicon nitride on a semiconductor wafer comprising:

contacting the silica and silicon nitride on the wafer with a polishing composition, the polishing composition comprising by weight percent 0.001 to 1 quaternary ammonium compound, 0.001 to 1 phthalic acid and salts thereof, 0.01 to 5 carboxylic acid polymer, 0.01 to 5 abrasive and balance water; and

polishing the silica and silicon nitride with a polishing pad.

10. The method of claim 9 wherein the quaternary ammonium compound is selected from the group comprising: tetramethyl ammonium hydroxide, tetraethyl ammonium hydroxide, tetrapropyl ammonium hydroxide, tetraisopropyl ammonium hydroxide, tetracyclopropyl ammonium hydroxide, tetrabutyl ammonium hydroxide, tetraisobutyl ammonium hydroxide, tetraterbutyl ammonium hydroxide, tetrasecbutyl ammonium hydroxide, tetracyclobutyl ammonium hydroxide, tetrapentyl ammonium hydroxide, tetracyclopentyl ammonium hydroxide, tetrahexyl ammonium hydroxide, tetracyclohexyl ammonium hydroxide, and mixtures thereof.